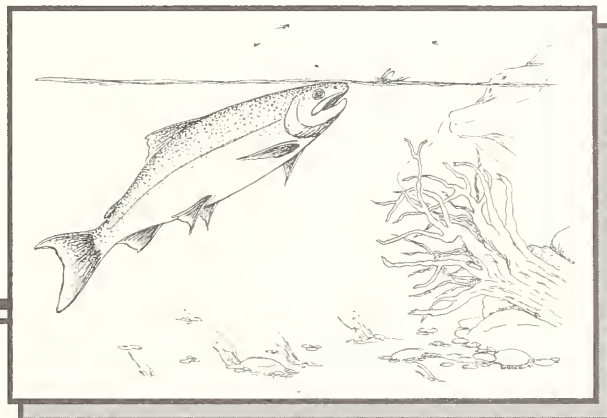


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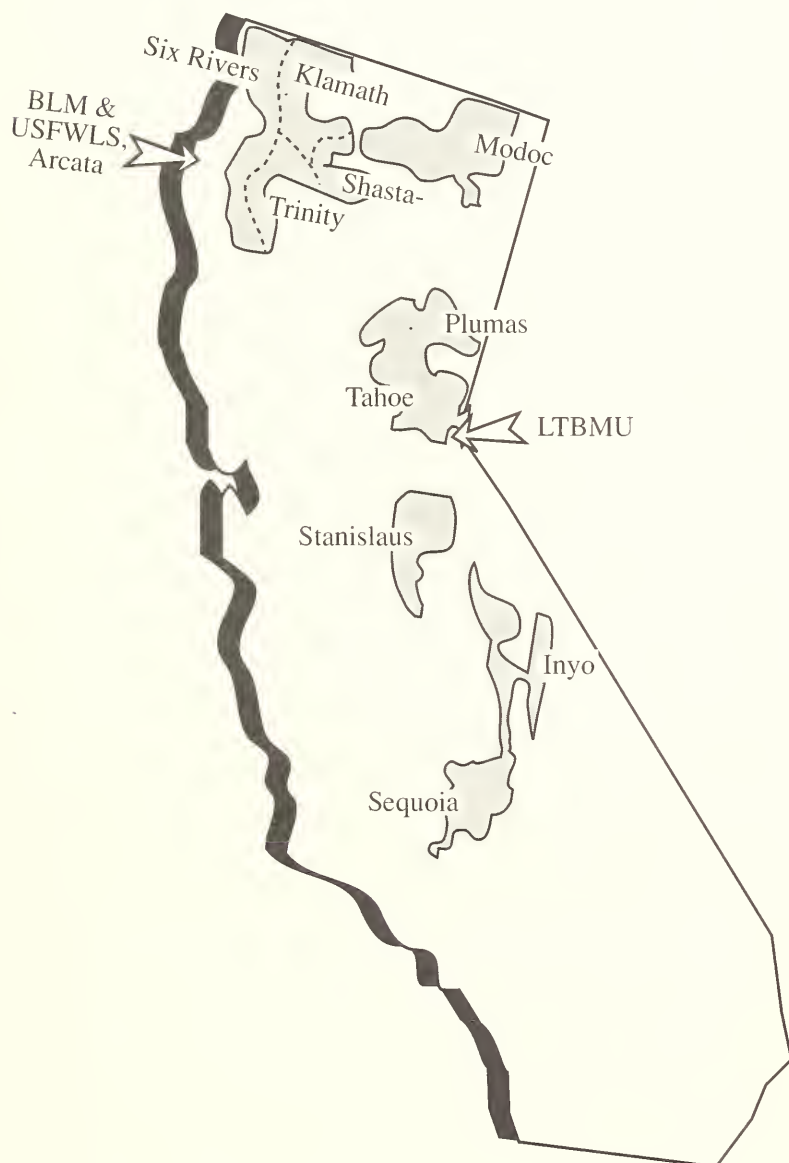
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FHR

CURRENTS...



R-5 Fish Habitat Relationship Technical Bulletin
Number 5 August 1991



A call was put out to fishery biologists throughout California offering this issue of *FHR Currents* as a forum for informal reports on projects that are pending, being planned or have been recently completed. We would like to thank those who took the time to respond and hope that your efforts encourage an even greater response for the next "Current Currents." We would like this to become a semi-annual issue to foster inter and intra-agency communication. This will be in addition to the usual *FHR Currents*, which is published as papers are submitted. We encourage anyone with a study or report of interest to the *FHR* community to contact Jerry Boberg, Dave Fuller or Stephanie Gomes for information and guidelines at the address on page 12 of this publication.



U.S. Department of Agriculture
Forest Service
Pacific Southwest Region



Inyo National Forest

Contact: Sara Chubb (619) 873-5841

This last year has been both frustrating and fulfilling for the fisheries program on the Inyo National Forest. We were handicapped by the loss of several District biologists and technicians. One frustration was the volume of proponent driven projects. We responded to three water diversion projects, one ski area, two major hydroelectric re-licenses, two controversial allotment plans in need of revision and untold recreational issues (primarily off-highway vehicle uses). In many cases, we did not have as much or as good of a baseline data base on local fisheries conditions as we would have liked. However, we took what we could from our completed R-5 stream surveys, GAWS monitoring, IFIM studies and residual-pool measurements. Using basic database summaries, we translated the raw data into usable information for decision making.

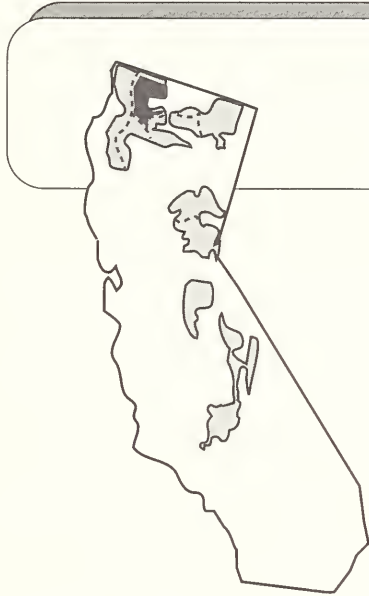
A fulfillment of sorts has been our quest for an equitable and effective means of monitoring livestock use along stream banks. Over the last year we experimented with the "Cowfish" techniques and developed our own approach that we call "Trampling and Chiseling" monitoring. We still need to do some statistical analysis on the efficiency of this technique and make some refinements in the coming field season. The monitoring of Trampling and

Chiseling is likely to be a controversial issue with both permittees and the environmental community.

Our fisheries enhancement work has been going strong. We continued our massive campaign to alleviate sediment problems for our Paiute cutthroat trout population in the White Mountains. We added numerous structures and livestock exclosures on the Kern Plateau for enhancement of golden trout. One of our projects did more good in bringing together the grazing permittee and angler volunteers in a joint effort than any other challenge-cost share program. Furthering relations with permittees is particularly crucial given the stress of the ongoing drought on limited resources and conflicts between the many user groups.

We have also been heavily involved with the development of a basin-wide trout interpretive plan. Some of the FHR information derived from our surveys has been applied to facility planning and better fisheries management in cooperation with CDF&G. The coming year will be critical in the forgoing of the many partnerships needed to implement a sweeping fisheries program.

"Furthering relations with permittees is particularly crucial given the stress of the ongoing drought on limited resources and conflicts between the many user groups."



Klamath National Forest

Contact: Greg DesLaurier (916) 468-5351

Spring-run chinook in the Salmon River drainage of California are at record lows based on trend information gathered since 1980. Spawning and holding habitat limitations, poaching, and over-harvest have been postulated as potential reasons for the observed trend. The objectives of this investigation were: (1) to identify summer-holding and spawning habitat of spring-run chinook in the south Fork Salmon River; and (2) to identify potential habitat limitations for spawning adults and determine stock-specific biological characteristics (i.e. age at spawning, fecundity, #males:females, #redds:females, etc.).

High frequency (151 mHz) radio transmitters were orally inserted into the guts of 30 salmon (22 females and 8 males) captured in the upper 18.5 miles of the South Fork Salmon above Matthews Creek. Subsequent locations were used to quantify the physical habitat characteristics and monitor pre-spawning behavior.

Of the initial 30 salmon tagged, 73% survived to spawn. Seven mortalities occurred from 10-32 days following capture and the eighth loss was due to transmitter failure. Bear signs (scat, tracks, hair, etc.) were evident at all but one of the early mortalities and at most of

the post-spawn mortalities, indicating this type of predation may be significant, especially during low flow years. Spawning began in the upper reach of the study area on September 22 and progressed until October 15, when the last tagged female spawned. All females excavated one redd with an average of 2.2 males at each excavation. Fecundity averaged 3,015 eggs.

Summer-holding and spawning habitat use data is currently being analyzed, but low gradient riffles associated with pools as well as runs appear to receive significant spawner use. Tentative analysis also indicates that bubble curtains and bedrock ledges were the dominant over-head cover types used in all summer holding habitats. High summer water temperatures (max > 26 C) coupled with low flows may have been an impediment to migration or a predisposition to mortality. Habitat use versus availability analysis is yet to be conducted, but the quantity and quality of spawning habitat does not appear to be limiting production as evidenced by the absence of redd superimposition or abandonment of excavations.

It is hoped that the final analysis, coupled with information currently being collected on the juvenile life stage, will provide valuable input for developing an effective recovery program for wild spring-run chinook in the Salmon River drainage.





Lake Tahoe Basin Mgmt. Unit

Contact: Jeff Reiner/Julie Perrochet (916) 573-2600

The Lake Tahoe Basin Management Unit continues to function as the hub for coordinating inland fisheries habitat relationships goals, objectives and information for Region 5.

In 1990, the LTBMU fisheries staff was involved in the completion of the Fisheries Habitat Assessment handbook, the training of habitat assessment crews, the development of a database management program and a South-zone functional assistance trip. Field projects included placement of spawning gravels in Taylor Creek (which is the most visited creek on the Unit and has a strong interpretive emphasis on fisheries), the re-introduction of the Lahontan cutthroat trout (a "Threatened" species) to the headwaters of the Upper Truckee River, and habitat assessment of ten percent of the stream miles in the Lake Tahoe

Basin. Habitat assessment data was used to analyze conditions in a high elevation range allotment and to complete a comprehensive report on habitat conditions in streams within the Heavenly Valley Ski Area.

Projects initiated in 1990 will see on the ground progress in 1991. The fisheries staff will work with the National Park Service in Yosemite and the Channel Islands, as well as the Man and the Biosphere program to gather information not attainable on National Forest lands and to share the habitat assessment procedures with other agencies. Also, the program manager will travel to Washington D.C. this year to deliver a presentation to the Chief's staff on the R-5 habitat assessment procedures and applications. On the Unit, habitat improvement work will be done in Burke, Taylor, and Blackwood Creeks. The boulder-cobble formed artificial reefs in Lake Tahoe will continue to be monitored for fish utilization. The fisheries staff will assist CDF&G work to place more Lahontan cutthroat trout in the Upper Truckee River.

Fisheries habitat assessment of streams on the Unit will continue to be a strong emphasis of the LTBMU fisheries program throughout the next decade.

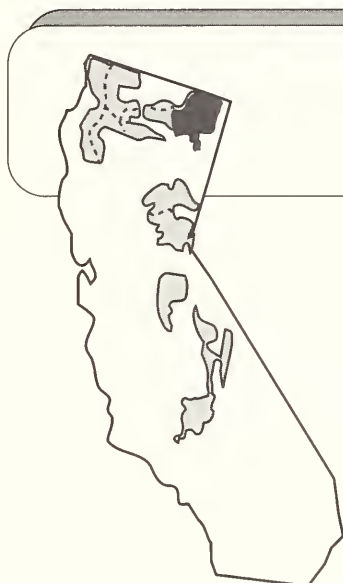
Bureau of Land Management,

Arcata Resource Area

Contact: Vicki Campbell (707) 822-7648

This summer the BLM plans to survey five streams/watersheds within the King's Range region of the Mattole watershed for erosion inventory and habitat typing. The office is also

working to coordinate erosion and watershed management among government, private and corporate landowners in the basin.



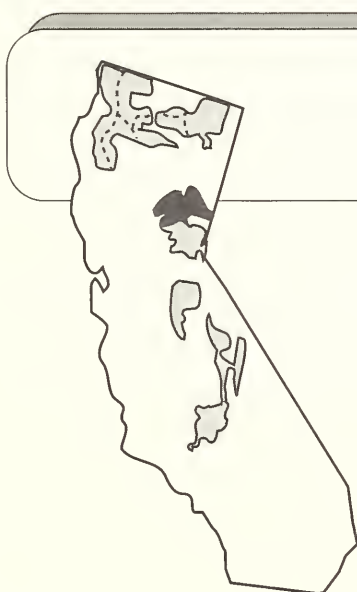
Modoc National Forest

Contact: Gina Sato (916) 233-5811

In 1990, FHR was used on the Modoc National Forest mainly to begin developing criteria for habitat enhancements for the federally endangered Modoc sucker (*Catostomus microps*). The Modoc sucker has a small distribution, mainly in streams that lose most of their surface waters in the summer, leaving the suckers to survive in isolated pools. Several past informal surveys have indicated that the

suckers do not use all of the perennial pools. Among both natural and enhancement project pools, some pools are used and some are not.

FHR analysis has several goals: (1) to determine the differences between the used and the unused pools so that we may be more confident of creating habitat that will be used by the species and improve the pools that are not being used; (2) to determine the critical needs for the suckers during other times of the year (e.g. refugia from spring-thaw flooding, substrates for spawning, refugia from winter temperatures and ice build-up) to avoid eliminating other essential habitat while creating summer habitat; and (3) to determine the habitat requirements of the other species in the stream so that we may be better able to maintain a balanced native species community.



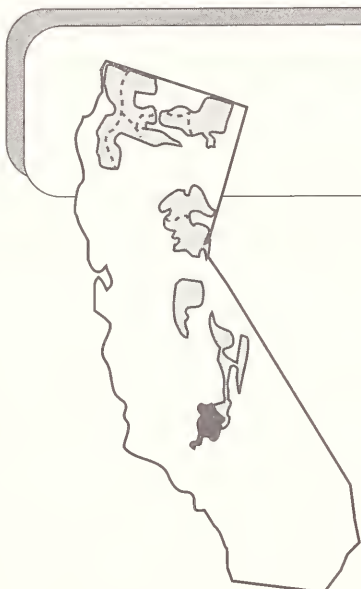
Plumas National Forest

Contact: Leslie Mink (916) 283-2050

During the 1990 field season, the fish crew on the Plumas inventoried 75 miles of stream. Some of the data gathered for a one-half mile section of

stream was used to identify types of structures for an enhancement project with a Coordinated Resource Management (CRM) group. In order to tailor the data gathering methodology to the ability of one of the CRM groups participating (high school students), a less subjective surveying method was devised.

Other uses of FHR data on the Plumas include the documentation of restoration project proposals to solicit funds from potential partners to rehabilitate streams degraded by grazing.



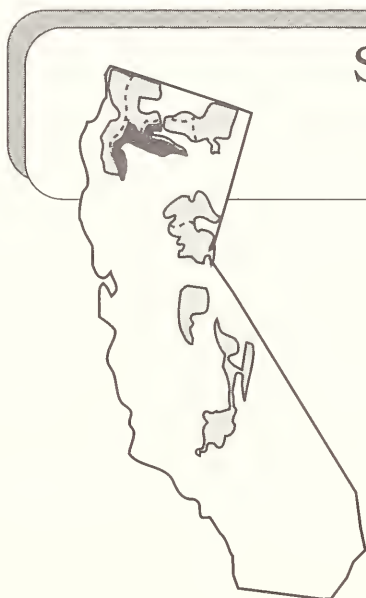
Sequoia National Forest

Contact: Matt Lechner (209) 784-1500

mendation will probably be to prohibit stocking of non-natives into the Kern drainage (i.e. CDF&G needs to develop KRR broodstock for hatchery stocking).

Approximately 100 miles of stream will be surveyed on the Sequoia this summer. In addition, appeals and litigations will continue to be a part of the biologist's routine. The South Coast Chapter of Trout Unlimited plans to adopt the North fork Kern River. The Labor Day project for Trout Unlimited this year will be restoration work on Tenmile Creek. All are invited to stop by for a good time over the holiday!

This summer (1991) looks to be a busy one. There are currently three hydro-power projects in various stages of the relicensing process, one on the Tule River and two on the Kern River (the lower Kern is a smallmouth fishery). A committee has been formed to consider the restoration needs of the Kern River Rainbow. First recom-



Shasta-Trinity National Forest

Hayfork Ranger District

Contact: Tina Mayo (916) 628-5227

Under the guidance of the new Fishery Biologist, Tina Mayo, the fisheries staff developed a structure monitoring program to assess fish utilization and abundance. The Habitat Typing program is still going strong, with plans to continue monitoring the changing conditions of the South Fork Trinity River. Over the past two years, much effort has gone into planting the riparian areas affected by the 1987 fires. These projects will continue in 1991.

The fisheries department had a busy year in FY90. Fish Habitat Improvement structure work was a large part of the work load, utilizing District and CCC crews to complete 70 stream enhancement structures.



Shasta-Trinity National Forest

Weaverville/Big Bar Zone

Contact: Melanie Anderson (916) 623-2121

INLAND FISHERIES

Habitat typing was completed for the exposed drawdown zone of the Trinity Reservoir and information was digitized to create a GIS database and basemaps. CDF conservation crews completed over 200 brush structures for bass habitat within Mule Creek and Buckeye Arms of the reservoir, additionally planting willows and seeding grasses. 250 acres of the drawdown zone adjacent to Trinity Center were aerially seeded with triticale in fall 1990. CDF&G reports new waterfowl concentrations at the site. USFS and CDF&G blasted 40+ craters in the exposed substrate at the northern end of the reservoir. Grants from the Trinity County Fish and Game Advisory Commission will enable us to blast an additional 200 craters, and to produce a video documenting the various inter-agency cooperative projects on the reservoir. BOR purchased a landing craft to be used in habitat restoration work in 1991, and work is in progress on an additional 200+ habitat structures. CDF&G and USFS are cooperating in an ongoing project to monitor fish use within treated vs. control coves on the reservoir (via electrofishing and visual observation).

Proposals submitted for FY91 include habitat typing, biological assessment, a meander analysis, a riparian inventory for the Upper Trinity River from the headwaters to the Trinity Reservoir, plus a physical/biological evaluation of 30 high mountain lakes in the Trinity Alps Wilderness Area.

ANADROMOUS FISHERIES

In 1990, habitat typing and juvenile fish surveys were completed on Rush Creek (Weaverville RD), Manzanita Creek and Price Creek (Big Bar RD) as projects within the Trinity River Restoration Program (TRRP). Biological data included occurrences of amphibians and reptiles. The MicroFish program will be used on the PC to statistically analyze fish standing crop information.

FY91 TRRP proposals include habitat typing and biological surveys for Sailor Bar, Soldier, Maple and Big Bar Creeks (Big Bar RD) and a riparian vegetation survey for Canyon Creek (Big Bar RD). A rearing side-channel is proposed for the Trinity River just above Lewiston (Weaverville RD). A study begun in July 1990 is examining seasonal habitat use by pre-smolt steelhead in two tributaries to the upper Trinity River. Sixty habitat units will be sampled by snorkeling every 4-6 weeks until December 1991. Dives will be made during the day in spring and summer, and at night when water temperatures decrease below 7 C.



Six Rivers National Forest

Contact: Jerry Boberg/Dave Fuller (707) 442-1721

The FHR program at Six Rivers National Forest continues to expand its efforts to meet the research needs critical to anadromous fisheries management. By the end of the 1991 field season, all of the major anadromous streams on the Forest will have been habitat typed. Dive teams will have conducted biological surveys of 20% of all habitat types on many of the typed streams. Two streams biologically surveyed last year will be re-surveyed this season and in subsequent years to note trends in populations. In addition, two streams will be re-habitat typed this season (previously typed in 1987 and 1990 respectively) by newly trained field crews to examine the repeatability of the methods. Habitat enhancement structure monitoring on the Forest has been expanded and incorporated into a protocol, with biological and physical features documented pre- and post-structure implementation for all projects. Expect to hear more about this as long term results become available in a few years!

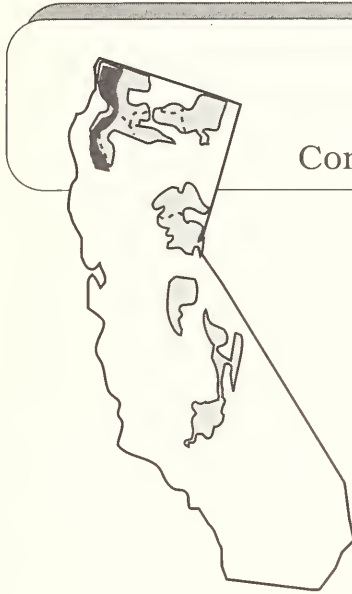
New studies for 1991 include a smolt trapping study with tube traps, a food availability/invertebrate drift study, a study to examine the design and function of cover structures, installation of stream gages on all barometer watersheds, examination of small tributaries to design sampling methods to conduct surveys, development and integration of Grouse Creek fish

habitat and watershed data into a Geographical Information System (ArcInfo), and continued analysis of habitat typing and biological data to evaluate components of fish habitat relationships.

Another project in the works is the creation of a region-wide Fisheries skills database "Knowledge Pool" to facilitate intra-agency coordination and the formation of "hit teams" to address regional problems. Publication of FHR Currents continues to serve as a communication and coordination link for FHR research region-wide.

The 1990-91 season saw some major changes in the staff at SRNF, most notable was the departure of Kerry Overton, who migrated to the Intermountain Forest and Range Experiment Station in Boise. He left a strong program and a dedicated staff of enthusiastic biologists headed by Jerry Boberg.





Smith River NRA

Six Rivers National Forest

Contact: Mike McCain/Wendy Cole (707) 457-3131

In the past decade, forest research and practice has indicated that natural processes associated with long term forest viability are extremely vital in maintaining stream productivity. The stream-forest interface is such a strong link that forest management is moving toward a basin or watershed unit ecosystem. A cooperative investigation has been undertaken at the Smith River NRA to study the links between streams and adjacent forests, integrating aspects from wildlife, landscape ecology, geomorphology, land use history, and fisheries. This will allow present conditions to be viewed in light of past activities and serve as a starting point for long term monitoring of management activities and disturbance recovery.

Short-term objectives are to: (1) investigate the relationships of large woody debris availability and recruitment to the distribution, abundance and community structure of aquatic vertebrates; (2) quantify the condition, distribution and abundance of stream habitat types created or influenced by large woody debris; (3) quantify the relative distribution and abundance of members of the aquatic community, stratified by habitat type; and (4) study the relationships of riparian and upland vegetation communities to large woody debris recruitment. Cooperators are Six Rivers National Forest, Pacific Southwest Forest and Range Experi-

ment Station, and the California Department of Fish and Game.

Abandoned mines are currently being assessed from the standpoint of potential impacts to water quality and macroinvertebrate communities. Sampling is being done during both high and low flow periods of 1991. Water is being analyzed for an array of heavy metals, hardness, pH and electroconductivity at mine sites (in mine shafts and in settling ponds), in creeks downstream from the sites and at upstream control sites. Preliminary findings indicate that (1) there is a statistically significant difference between pH values in at least one of the mine sites and its respective control site; (2) the concentrations of zinc, copper and nickel exceeded EPA water quality standards for freshwater life at several mine sites and in at least one of the creeks into which the mine drains.

Macroinvertebrate communities will be sampled in spring and late summer to determine if there is a difference between the control sites and the creeks draining the mines. Comparison criteria will include relative abundances, species composition, indicator species and community diversity. Habitat assessments will also be made to characterize the extent of disturbance with respect to denudation of the land, juxtaposition of large tailings piles at streamside, and recovery potential in terms of revegetation and tailings removal. This study is being funded through the EPA Federal Facilities Compliance Program.





Stanislaus National Forest

Contact: Bob Ruediger (209) 532-3671

In 1990, the Stanislaus National Forest conducted an inventory of large woody debris (LWD) on the forest. A total of 97 plots were inventoried on 17 different streams. The plots occurred between 1109-2316 m (3640-7600 feet) elevation. The plots were in mixed conifer and red fir/lodgepole pine zones. Fifty-seven plots were located in unlogged riparian areas, 18 plots were in salvage logged riparian areas, and 18 plots were in railroad logged riparian areas. LWD was defined as all pieces of wood greater than one meter long and 10 cm in diameter (at the large end).

The forest-wide average volume was 132.9 m³/hectare. We found no difference in volumes

between the salvage logged (204.7 m³/hectare) and unlogged plots (135.9 m³/hectare); however, the railroad plots (51.4 m³/hectare) had significantly less wood. Volume declined as stream order increased: 2nd order--320.9 m³/hectare; 3rd order--181.7 m³/hectare; 4th order--115.8 m³/hectare; and 5th order--36.5 m³/hectare. We found the highest volumes in A-channels (168.6 m³/hectare), followed by C-channels (116.5 m³/hectare) and B-channels (109.1 m³/hectare). There were 18 plots where volume exceeded 200 m³/hectare (range 214-1175 m³/hectare); these plots are similar to volumes (230-750 m³/hectare) reported from streams in old-growth forests in the Oregon Cascades.

Stable LWD was defined as pieces that stored sediment, had one or both ends buried, and/or were longer than the average channel width. Stable debris made up only 30.1% of the total number of pieces of wood, but represented 69.4% of the LWD volume. There was an average of 5.1 stable pieces per 100 meters. The number of stable pieces and total pieces per 100 meters declined as stream order increased. Pieces of wood with an average diameter greater than 30 cm made up 38.2% of the total number of pieces and 92.5% of the volume.





Tahoe National Forest

Contact: Ron Medel/Ann Carlson (916) 265-4531

The fish biologists on the Tahoe are creating a proactive integrated fisheries program. This summer we are moving one step ahead on our EA and EIS process by conducting assessments on the streams that flow through the 1993 timber sale management areas. Until the Tahoe has district fisheries biologists, these surveys will help to integrate fisheries program objectives into the overall planning efforts on the districts. In addition to timber related fisheries and aquatic resource surveys, we will be conducting intensive assessments in areas inhabited by Lohontan cutthroat trout (federally listed as Endangered) and streams suitable for re-introduction of this species.

The Tahoe National Forest is excited to be designated as the site of the Regional Demonstration Watershed Project for Inland Fisheries. This project exemplifies the concepts voiced in New Perspectives, with fisheries and watershed analysis driving development of an

integrated resource improvement plan. Perazzo Creek was surveyed in 1989 and 1990. This information, in conjunction with information from Range, Timber, Wildlife, Recreation, Soils, and Engineering will be used to construct a multi-year planning document for fish, riparian and watershed. The identified and prioritized watershed improvements will require Range, Timber, Fisheries and Wildlife specialists to work together for the betterment of the watershed and its resources.

Many fisheries habitat improvement projects are scheduled to take place this summer, including several KV projects that are the first planned with our current fisheries staff. In the latter part of this summer, we will be involved in the Tahoe's first major fencing project (block and log) to restore channel integrity and riparian vegetation. The Loney meadows/Texas Hill Creek project will include the planting of aspen and willow trees, crib fencing to protect the plantings and recruitment of wood to the stream. The project is a cooperative effort involving the Forest Service, the Nevada County Fish and Wildlife Commission, and the Izaak Walton League of America.



USFWS, Coastal California

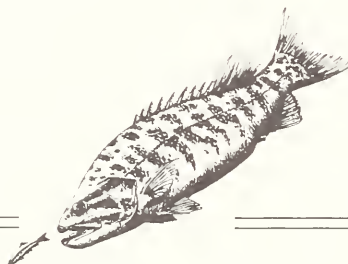
Fishery Resource Office

Contact: Sandy Noble (707) 822-7201

This summer the Fishery Resource Office will be coordinating with the National Park Service and California Department of Fish and Game to begin a study of the Merced River in Yosemite National Park. Due largely to the cooperation of a progressive park superintendent, this will be the first major effort to study the Merced, which has been severely impacted from public use. The study will include the R-5 habitat typing system and the Hankin-Reeves method of

population estimation to gather data for recommendations to restore the river.

The crews will also be working on a modified habitat typing system to assess small tributaries in the lower Klamath River system, as well as continuing to monitor population trends related to habitat types in the New River (tributary to the Trinity River).



FHR CURRENTS... Purpose

The Fish Habitat Relationship (FHR) Program of R-5 USFS has been established to research and develop information on fish ecology and to coordinate effective applications of this knowledge in managing and protecting our fisheries. By relating life stage requirements of specific species to physical habitat parameters, we are aiming at our main objective: developing a methodology to manage fisheries through the management of habitat.

If you wish to submit a paper for publication in the FHR Currents, please write Jerry Boberg, Dave Fuller (Technical Editors) or Stephanie Gomes (Editor) for information and guidelines at: Six Rivers National Forest, 500 5th Street, Eureka, CA 95501; or call (707) 442-1721.

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